

A.) AMENDMENTS TO THE CLAIMS:

1. (currently amended) A method of operating a service network connected to ~~an~~ a high-speed access network infrastructure in which layer one and layer two resources are shared with other service networks, comprising the steps of:

receiving, at a tunneling endpoint in the service network, an encapsulated packet transmitted from an access network device connected to the high-speed access network infrastructure by an upstream and a downstream channel assigned by the high-speed access network infrastructure, the network device having a source address assigned by the service network and related based on a subscription to services offered by the service network;

de-encapsulating the packet to reveal the source address; and

if the access-network device source address is associated with an authorized subscriber to services offered by the service network, forwarding the packet to a destination network address indicated in the packet, thereby packet after said de-encapsulating, thereby effectuating the services offered by the service network.

2. (previously presented) The invention of claim 1 wherein the tunneling endpoint is a router and the packet is de-encapsulated using a layer three tunneling technique.

3. (previously presented) The invention of claim 2 wherein the layer three tunneling technique is IP within IP encapsulation.

4. (previously presented) The invention of claim 2 wherein the layer three tunneling technique is minimal IP encapsulation.

5. (previously presented) The invention of claim 1 wherein the tunneling endpoint is a layer two tunneling network server and the packet is de-encapsulated using a layer two tunneling technique.

6. (previously presented) The invention of claim 5 wherein the layer two tunneling technique is L2TP.

7. (currently amended) The invention of claim 1 wherein the service networks utilize the Internet Protocol and wherein the source and destination addresses are Internet Protocol addresses.

8. (currently amended) The invention of claim 1 wherein the service network is operated by an Internet Service Provider different from an entity operating the high-speed access network infrastructure.

9. (previously presented) The invention of claim 8 wherein the service networks are operated by different Internet Service Providers.

10. (previously presented) The invention of claim 8 wherein the service networks offer access to different Internet Protocol-based services.

11. (previously presented) The invention of claim 1 wherein the access network infrastructure comprises a hybrid fiber coaxial network.

12. (previously presented) The invention of claim 1 wherein the tunneling endpoint is one of a plurality of tunneling endpoints in the service network, each having a virtual interface with a network address, and wherein the encapsulated packet is addressed to the network address of the virtual interface.

13. (currently amended) A method of operating a network access device connected to ~~an~~ a high-speed access network infrastructure connected to a plurality of service networks, comprising ~~the steps of:~~

creating a packet related to services offered by a service network, the packet having a source address assigned by the service network to the network access device and a first destination address;

encapsulating the packet by including a source address assigned by the high-speed access network infrastructure to the network access device and a second destination address corresponding to a tunneling endpoint of the service network; and

tunneling the packet, after said encapsulating, to a the tunneling endpoint in the service network via a downstream channel of the high-speed access network infrastructure so that the tunneling endpoint can de-encapsulate the packet and forward the packet to it's the first destination ~~network~~ address, thereby effectuating the services offered by the service network.

14. (previously presented) *The invention of claim 13 wherein the tunneling endpoint is a router and the packet is encapsulated using a layer three tunneling technique.*

15. (previously presented) *The invention of claim 14 wherein the layer three tunneling technique is IP within IP encapsulation.*

16. (previously presented) *The invention of claim 14 wherein the layer three tunneling technique is minimal IP encapsulation.*

17. (previously presented) *The invention of claim 13 wherein the tunneling endpoint is a layer two tunneling network server and the packet is encapsulated using a layer two tunneling technique.*

18. (previously presented) *The invention of claim 17 wherein the layer two tunneling technique is L2TP.*

19. (currently amended) *The invention of claim 13 wherein the service networks utilize the Internet Protocol and wherein the source and destination addresses are Internet Protocol addresses.*

20. (currently amended) *The invention of claim 13 wherein the service network is operated by an Internet Service Provider different from an entity operating the high-speed access network infrastructure.*

21. (previously presented) *The invention of claim 20 wherein the service networks are operated by different Internet Service Providers.*

22. (previously presented) The invention of claim 20 wherein the service networks offer access to different Internet Protocol-based services.

23. (previously presented) The invention of claim 13 wherein the access network infrastructure comprises a hybrid fiber coaxial network.

24. (previously presented) The invention of claim 13 wherein the tunneling endpoint is one of a plurality of tunneling endpoints in the service network, each having a virtual interface with a network address, and wherein the encapsulated packet is addressed to the network address of the virtual interface.